NEW BRISTOL 170

Detail Refinement Gives Greater Payload and Longer Range : "Free-exit" Cowls : New D.H. Airscrews

OBJECT lessons in aerodynamics and economics are to be learned from what might be described as the "1948 Model" of the Bristol 170 transport aircraft. Generically termed the XX Series, the main variants of the New Type 170 are the Mark XXI (Freighter); XXIA (Freighter equipped for cargo/passenger work); XXIIA (Wayfarer passenger aircraft); and XXIE (mixed traffic aircraft with adjustable bulkhead). Of these the XXIE possesses features which should make a particularly strong appeal to charter operators.

The New Type 170 exemplifies, perhaps better than any other large aircraft of recent years, what can be accomplished by logical application of operational experience and diligent analysis of performance. Briefly stated, a 10ft increase of wing span and structural stiffening have combined with a new engine and airscrew installation and detail aerodynamic refinements to allow a substantially increased payload and a much longer range, with, it is claimed, an all-round improvement in performance and handling characteristics, notably in the single-engine condition. The new aircraft—for such it may justly be termed—is now offered as a successor to the earlier Freighter and Wayfarer, and, enhancing as it does the unique qualities inherent in the design, should soon be earning money in several currencies.

Compared with the earlier models, the most obvious superficial difference is the increase in wing span from 98 to 108ft, achieved by the adoption of new-type rounded tips. The area is thus increased from 1,405 sq ft to 1,487 sq ft. With the aircraft operating at the former all-up weight of 37,000 lb, the resulting diminution of induced drag gives a marked improvement in single-engine rate of climb, while at the new certified weight of 40,000 lb the climb in all conditions has proved to be comfortably in excess of A.R.B. requirements.

To meet the new demands made upon the strength of the wing by the increase in span and flying weight, and to maintain the standard of durability in service established by the original wing, the internal structure has been reinforced and stiffened. The increased bending moment is counteracted by an auxiliary spar boom, in the form of an extrusion attached to the upper boom of the forward spar, extending throughout the wing. To prevent the development of excessive loads in the skin there are now nine anti-strain channels (three in each main wing panel and three in the centre-section), running fore and aft in the top surface. These channels allow the wing to flex without permanently deforming the skin. Another innovation associated with the wing is the installation of two 100-gallon fuel tanks between the spars of the mainplanes, outboard of the engine nacelles. The main inboard tanks now hold 350 gallons each, bringing the total fuel capacity to 900 gallons—a 50 per cent increase over the original tankage.

It will be evident from the foregoing that the structural alterations to aircraft of the older type can only be made under Bristol supervision, and the company is prepared to quote for the complete modernization of existing airframes.

Engine Installation

Another vital contribution to the performance of the New Type 170 has been made by the Engine Division at Filton. The new "free-exit" cowl applied to the Hercules 672 engines is primarily beneficial in permitting the release of more thrust horse-power, which is turned to good account on climb. Not only does it reduce cooling drag and improve cooling (especially under tropical conditions), but saves weight and simplifies operation and maintenance.

Physically, the Hercules 672 differs little from the Hercules 638 installed in previous versions of the Freighter

Apart from the positioning of the fuselage air intakes for the Janitrol heaters, the new-type engine cowls and de Havilland airscrews of increased diameter, there is little in this view to distinguish the New Type Bristol 170 from previous models.